

Appendix 21

Recreation Resources

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Appendix 21A

Impact of NODOS Project Operations on Recreation-Day Benefit Values

IMPACT OF NODOS PROJECT OPERATIONS ON RECREATION-DAY BENEFIT VALUES

Table 21A-1
San Luis Reservoir Recreation-Day Benefit Values^a

San Luis Reservoir		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	544	Average	Area	Value
MWE Surface Area (acres) =	12700	Surface Area^b	Ratio	Points
Existing Condition		8775	0.691	4.0
NODOS Alternative A		8704	0.685	3.5
NODOS Alternative B		8723	0.687	4.0
NODOS Alternative C		8628	0.679	3.0
No Action Alternative		8742	0.688	4.0

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

Table 21A-2
Trinity Lake Recreation-Day Benefit Values with Alternative NODOS Operations^a

Trinity Lake		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	2370	Average	Area	Value
MWE Surface Area (acres) =	16335	Surface Area^b	Ratio	Points
Existing Condition		12356	0.756	12.0
NODOS Alternative A		12590	0.771	15.0
NODOS Alternative B		12603	0.772	15.0
NODOS Alternative C		12636	0.774	16.0
No Action Alternative		12386	0.758	13.0

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

Table 21A-3
Shasta Lake Recreation-Day Benefit Values with Alternative NODOS Operations^a

Shasta Lake		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	1067	Average	Area	Value
MWE Surface Area (acres) =	29740	Surface Area^b	Ratio	Points
Existing Condition		24136	0.812	28.0
NODOS Alternative A		24514	0.824	33.0
NODOS Alternative B		24580	0.826	33.0
NODOS Alternative C		24590	0.827	33.0
No Action Alternative		24109	0.811	28.0

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^b Average end-of-month surface area in acres.

Table 21A-4

Lake Oroville Recreation-Day Benefit Values with Alternative NODOS Operations^a

Lake Oroville		April-Sept Average Surface Area^b	Surface Area Ratio	Benefit Value Points
Maximum Water Elevation (feet) =	899			
MWE Surface Area (acres) =	15805			
Existing Condition		12331	0.780	17.5
NODOS Alternative A		12345	0.781	17.5
NODOS Alternative B		12349	0.781	17.5
NODOS Alternative C		12330	0.780	17.5
No Action Alternative		12232	0.774	16.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

Table 21A-5

Folsom Lake Recreation-Day Benefit Values with Alternative NODOS Operations^a

Folsom Lake		April-Sept Average Surface Area^b	Surface Area Ratio	Benefit Value Points
Maximum Water Elevation (feet) =	456			
MWE Surface Area (acres) =	11450			
Existing Condition		9177	0.801	25.0
NODOS Alternative A		9224	0.806	26.5
NODOS Alternative B		9189	0.803	26.0
NODOS Alternative C		9226	0.806	26.5
No Action Alternative		9087	0.794	22.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

Table 21A-6

Sites Reservoir Recreation-Day Benefit Values with Alternative NODOS Operations^a

Sites Reservoir		April-Sept Average Surface Area^b	Surface Area Ratio	Benefit Value Points
Maximum Water Elevation (feet) =	520			
MWE Surface Area (acres) =	14100			
Maximum Water Elevation (feet) =	480			
MWE Surface Area (acres) =	12400			
NODOS Alternative A (480 feet)		10099	0.814	30.0
NODOS Alternative B (520 feet)		11046	0.783	19.0
NODOS Alternative C (520 feet)		12021	0.853	39.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

	April	May	June	July	August	September			Operation Points*
	(End of Month Surface Area)						Average	Ratio	
FOLSOM LAKE									
Existing Condition	9505	10249	10045	9082	8447	7734	9177	0.801	25.0
NODOS Alternative A	9528	10252	10046	9194	8497	7826	9224	0.806	26.5
NODOS Alternative B	9496	10207	10017	9121	8454	7841	9189	0.803	26.0
NODOS Alternative C	9520	10245	10059	9160	8515	7854	9226	0.806	26.5
No Action Alternative	9478	10219	9984	8943	8292	7603	9087	0.794	22.5
NODOS Alternative A	9528	10252	10046	9194	8497	7826	9224	0.806	26.5
NODOS Alternative B	9496	10207	10017	9121	8454	7841	9189	0.803	26.0
NODOS Alternative C	9520	10245	10059	9160	8515	7854	9226	0.806	26.5
Maximum Water Elevation	456 feet								
MWE Surface Area	11450 acres								
SITES RESERVOIR									
Existing Condition	0	0	0	0	0	0	0	0.000	0.0
NODOS Alternative A	10936	10754	10484	9897	9486	9036	10099	0.814	30.0
NODOS Alternative B	11793	11671	11331	10807	10501	10175	11046	0.783	19.0
NODOS Alternative C	12699	12572	12336	11889	11489	11141	12021	0.853	39.5
No Action Alternative	0	0	0	0	0	0	0	0.000	0.0
NODOS Alternative A	10936	10754	10484	9897	9486	9036	10099	0.814	30.0
NODOS Alternative B	11793	11671	11331	10807	10501	10175	11046	0.783	19.0
NODOS Alternative C	12699	12572	12336	11889	11489	11141	12021	0.853	39.5
Maximum Water Elevation	520 feet		Alternative B and C						
MWE Surface Area	14100 acres								
Maximum Water Elevation	480 feet		Alternative A						
MWE Surface Area	12400 acres								

*Operations points for the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation. (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

Appendix 21B

Impact of NODOS Project Operations on Usability of Reservoir Boat Ramps

Table 21B-1
Number of Years and Months Boat Ramps at San Luis Reservoir are Not Usable Due to Reservoir Operations

		Existing Conditions			No Project/No Action Alternative			Alternative A			Alternative B			Alternative C		
Name of Boat Ramp	Bottom Elevation	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Dinosaur Point	378	31	94	19.1%	33	93	18.9%	33	89	18.1%	32	90	18.3%	36	96	19.5%
Basalt Boat Ramp	340	4	7	1.4%	3	4	0.8%	1	1	0.2%	3	3	0.6%	1	3	0.6%
Total Months Dewatered																
		101			97			90			93			99		
Percent Decrease in Dewatering Compared to Existing Conditions																
					-14.2%			-20.4%			-17.7%			-12.4%		
Percent Decrease in Dewatering Compared to the No Project/No Action Alternative																
								-13.5%			-10.6%			-4.8%		

Table 21B-2
Number of Years and Months Boat Ramps at Trinity Lake are Not Usable Due to Reservoir Operations

Name of Boat Ramp	Bottom Elevation	<i>Existing Conditions</i>			<i>No Project / No Action Alternative</i>			<i>Alternative A</i>			<i>Alternative B</i>			<i>Alternative C</i>		
		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Stuart Fork	2,338	64	303	62%	65	301	61%	64	292	59%	64	291	59%	64	291	59%
Clark Springs	2,324	57	251	51%	56	242	49%	55	237	48%	56	235	48%	55	234	48%
Bowerman	2,323	56	246	50%	56	242	49%	56	237	48%	56	234	48%	55	233	47%
Fairview	2,313	52	218	44%	49	207	42%	50	199	40%	50	200	41%	50	195	40%
Trinity Center	2,300	48	182	37%	45	167	34%	43	157	32%	41	149	30%	44	153	31%
Cedar Stock	2,230	10	37	8%	11	37	8%	10	31	6%	10	36	7%	10	33	7%
Minersville	2,170	3	4	0.8%	3	5	1.0%	1	1	0.2%	1	2	0.4%	1	1	0.2%
Total Months Dewatered		1241			1201			1154			1147			1140		
Percent Decrease in Dewatering Compared to Existing Conditions					-3.2%			-7.0%			-7.6%			-8.1%		
Percent Decrease in Dewatering Compared to the No Project / No Action Alternative								-3.9%			-4.5%			-5.1%		

Table 21B-3
Number of Years and Months Boat Ramps at Shasta Lake are Not Usable Due to Reservoir Operations

Name of Boat Ramp	Bottom Elevation	<i>Existing Conditions</i>			<i>No Project / No Action Alternative</i>			<i>Alternative A</i>			<i>Alternative B</i>			<i>Alternative C</i>		
		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Bailey Cove	1,017	65	195	19.1%	67	202	18.9%	61	182	18.1%	62	182	18.3%	61	168	19.5%
Antlers	992	31	99	2.4%	33	103	1.4%	27	88	1.8%	26	89	1.6%	27	87	1.8%
Hirz Bay	972	19	71	1.4%	18	70	0.8%	15	56	0.2%	15	51	0.6%	16	54	0.6%
Packers Bay	952	11	42		13	48		11	39		10	38		11	38	
Silverthorn Marina	942	10	35		11	41		11	37		9	33		8	26	
Digger Bay Marina	937	9	30		11	37		8	27		8	29		7	22	
Sugarloaf	907	7	20		8	23		8	18		6	17		6	13	
Bridge Bay Resort	882	7	18		7	16		5	10		5	11		4	9	
Centimudi/Jones Valley	857	5	11		5	11		4	8		5	8		2	4	
Total Months Dewatered		521			551			465			458			421		
Percent Decrease in Dewatering Compared to Existing Conditions					5.8%			-10.7%			-12.1%			-19.2%		
Percent Decrease in Dewatering Compared to the No Project / No Action Alternative								-15.6%			-16.9%			-23.6%		

Table 21B-4
Number of Years and Months Boat Ramps at Lake Oroville are Not Usable Due to Reservoir Operations

		<i>Existing Conditions</i>			<i>No Project / No Action Alternative</i>			<i>Alternative A</i>			<i>Alternative B</i>			<i>Alternative C</i>		
Name of Boat Ramp	Bottom Elevation	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Loafer Creek	775	45	125	25.4%	46	129	26.2%	44	123	25.0%	43	122	24.8%	41	119	24.2%
Enterprise	750	32	93	18.9%	34	92	18.7%	35	89	18.1%	34	90	18.3%	34	92	18.7%
Lime Saddle	702	19	51	10.4%	20	52	10.6%	18	47	9.6%	19	46	9.3%	20	48	9.8%
Spillway	695	19	47	9.6%	29	50	10.2%	17	42	8.5%	18	43	8.7%	19	46	9.3%
Bidwell Canyon*	675	5	12	2.4%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
Total Months		328			323			301			301			305		
Percent Decrease in Dewatering Compared to Existing Conditions					-1.5%			-8.2%			-8.2%			-7.0%		
Percent Decrease in Dewatering Compared to the No Project / No Action Alternative								-6.8%			-6.8%			-5.6%		
* The Bidwell Canyon low water ramp would be extended with implementation of the No Project/No Action Alternative to a bottom elevation at which it would always be in the water. Alternatives A, B, and C would not change those conditions.																

Table 21B-5
Number of Years and Months Boat Ramps at Folsom Lake are Not Usable Due to Reservoir Operations

Name of Boat Ramp	Bottom Elevation	<i>Existing Conditions</i>			<i>No Project / No Action Alternative</i>			<i>Alternative A</i>			<i>Alternative B</i>			<i>Alternative C</i>		
		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Rattlesnake Bar/New Stage Four	425	44	143	29.1%	46	154	31.3%	38	135	27.4%	42	139	28.3%	35	130	26.4%
Five Percent/Folsom Point	408	26	76	15.4%	29	85	17.3%	24	74	15.0%	24	71	14.4%	26	75	15.2%
Folsom Lake Marina/Stage One	395	12	38	7.7%	14	45	9.1%	16	37	7.5%	12	39	7.9%	14	35	7.1%
Hobie Cove	375	4	13	2.6%	4	14	2.8%	4	11	2.2%	3	13	2.6%	5	11	2.2%
Low Water	370	4	13	2.6%	4	14	2.8%	3	10	2.0%	3	12	2.4%	3	9	1.8%
Total Months Dewatered		283			312			267			274			260		
Percent Decrease in Dewatering Compared to Existing Conditions					10.2%			-5.7%			-3.2%			-8.1%		
Percent Decrease in Dewatering compared to the No Project / No Action Alternative								-14.4%			-12.2%			-16.7%		

Table 21B-6

Number of Years and Months Boat Ramps at Sites Reservoir are Not Usable Due to Reservoir Operations

		Alternative A			Alternative B			Alternative C		
		NWS=480 feet			NWS=520 feet			NWS=520 feet		
Name of Boat Ramp	Bottom Elevation	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Stone Corral	400	17	75	15.2%	16	78	15.9%	11	39	7.9%
Unknown	420	29	113	23.0%	19	86	17.5%	13	66	13.4%
Total Months										
Dewatered		188			164			105		
Percent										
Decrease in Dewatering Compared to Alternative A										
Percent					-12.8%			-44.1%		
Decrease in Dewatering Compared to Alternative B										
								-35.98%		